DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	*EQUISTAR CHEMICALS, LP*
Facility Address:	*8805 North Tabler Road, Morris, Illinois 60450*
Facility EPA ID #:	*ILD048296180*

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	x			*Arsenic (As) levels exceed R-9 Groundwater (WG) Screening Levels in Gypsum Pile Area (GPA) [Ref. 5, below]*
Air (indoors)[2]		x		
Surface Soil (e.g., <2 ft)	x			*As & Antimony (Sb) exceed SSL for protection of GW [1-5]*
Surface Water		x		
Sediment		x		
Subsurf. Soil (e.g., >2 ft)	x			*As, Sb, & PAHs exceed SSL for protection of GW [1-5]*
Air (outdoors)		x		

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

1.- Focused Risk-Based Assessment - Former Waste Water Treatment Plant (WWTP) Surface Impoundments (Woodward-Clyde Consultants, August 8, 1996), and 12/31/97 Final Closure Documentation Report for the WWTP, prepared by Woodward Clyde Consultants (WWC).
2.- 2/11/94 Remediation Documentation Report - Area D, and 12/02/97 Phase II RFI Report for Area D.
3.- 05/15/97 Revised Appendix D: Evaluation of Basin No.2 Confirmation Soil Sampling (WCC).
4.- 02/03/94 Geological Evaluation Report for Gypsum Pile Area (Hanson Engineers), and
5.- February 2000 Baseline Risk Assessment for River Property/Gypsum Pile Area (Montgomery Watson).

The maximum detected concentration of Arsenic (As) in soils at the Gypsum Pile Area (GPA) is slightly below two times the SSL for protection of groundwater (56.7 vs. 29mg/kg). Relatively low levels of PAHs have also been detected in the soils at all the SWMUs of concern at the facility.

The max. detected groundwater concentration of As at the GPA is 0.01 mg/L, which is higher than the U.S. EPA groundwater screening level of 0.0015mg/L. In addition, the groundwater at the Gypsum Pile Area currently exceeds the Illinois EPA drinking water standards for fluoride, iron, manganese and sulfate.

Footnotes:

[1] Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	_No__	_No__	_No__	_No__	No	No	_No
~~Air (indoors)~~	___	___	___				
Soil (surface, e.g., <2 ft)	_No__	_No__	_No__	_No__	_No__	_No__	No_
~~Surface Water~~	___	___			___	___	___
~~Sediment~~	___	___			___	___	___
Soil (subsurface e.g., >2 ft)	No	No	No	_No__	No	No	_No
~~Air (outdoors)~~	___	___	___	___	___		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("____"). While these combinations may not be probable in most situations, they may be possible in some settings and should be added as necessary.

__X__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

For Rationale see additional page 3A.

Because this facility has 10 discrete solid waste management units (SWMUs) of concern there are numerous documents which describe investigations, remediation efforts, and risk assessments on residual contamination at each of these SWMUs. The following is a list of the main documents which describe the corrective action activities at these units:

REFERENCES: *Focused Risk-Based Assessment - Former Waste Water Treatment Plant (WWTP) Surface Impoundments (Woodward-Clyde Consultants, August 8, 1996), and 12/31/97 Final Closure Documentation Report for the WWTP, prepared by Woodward Clyde Consultants (WWC).*
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February 2000 Baseline Risk Assessment for River Property/Gypsum Pile Area (Montgomery Watson).

3 Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Rationale for concluding that there are no complete pathways between "contamination" and human receptors at the Equistar facility.

Surface and Subsurface Soils: No complete pathways
Nine of the ten SWMUs at Equistar were remediated by removing the contaminated soils. The clay and residual soils at these SWMUs are still contaminated with polycyclic aromatic hydrocarbons (PAHs) and metals, but the contamination does not pose a significant threat to human health or the environment. These SWMUs have been backfilled and covered as necessary.

The soils and subsurface soils at the 10th SWMU at Equistar, identified as the Gypsum Pile Area (GPA), have also been shown to be contaminated with low levels of PAHs and metals (Arsenic in particular), in some areas. However, exposures are not expected under current land and groundwater use conditions. The GPA has not been actively used since 1978. Workers in the GPA (which is still undergoing corrective actions) are trained to control exposures to hazardous materials in according with OSHA regulations.

The access to all the SWMUs at the Equistar facility is restricted so that humans will not come into direct contact with any contaminated soils, including the remaining soils and/or contaminated clay liner materials remaining in some of the units where corrective actions have been completed. Protective covers have been installed in 8 of Equistar's SWMUs, where the concentration levels of some PAHs exceeded risk-based screening levels for an industrial scenario. No trespassers are expected, as this industrial facility is surrounded by a well-maintained security fence.

No residences, buildings or sensitive receptors are located above or adjacent to contaminated soil. In addition, no food items are grown on contaminated soils. Although there are two fishing ponds close to the GPA, no one is currently fishing in these areas, and no fishing will be allowed until a risk assessment and/or any needed corrective actions will be completed at the GPA and the fishing ponds.

Groundwater: No complete exposure pathways are expected regarding the groundwater.
The only area at the facility where there have been clear indications of groundwater contamination (mainly Arsenic) is at the Gypsum Pile Area (GPA). The GPA has not been actively used since approximately 1978. Groundwater data indicates that there have been practically no changes in the groundwater quality in recent years.

There are no drinking water wells at the GPA or in the proximity of the Equistar facility. No exposure to shallow groundwater occurs on the GPA property, and Equistar will use institutional controls to prevent placement of drinking water wells in the shallow aquifer at the GPA. In addition, the potential impact of this groundwater on the quality of the Illinois River (close to the GPA) was determined to be insignificant.

No residences, buildings, or sensitive receptors are located above or adjacent to contaminated groundwater. The GPA is surrounded by a well-maintained security fence. The fence has a detection system that allows Equistar to detect if trespassing attempts have been made, so the system can be further improved if necessary.

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the ***Equistar Chemicals, LP*** facility, EPA ID ***#ILD048296180***, located at ***8805 North Tabler Road, Morris, Illinois 60450*** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) Juana E. Rojo Date 3/13/2000
(print) Juana E. Rojo
(title) Corrective Action Project Manager

Supervisor (signature) Date 5/4/00
(print) Hak K. Cho
(title) Chief, Corrective Action Section
(EPA Region or State) Region 5

Locations where References may be found:

RCRA Files, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.